IN THE CLAIMS:

The text of all pending claims, (including withdrawn claims) is set forth below. Cancelled and not entered claims are indicated with claim number and status only. The claims as listed below show added text with <u>underlining</u> and deleted text with ~~strikethrough~~. The status of each claim is indicated with one of (original), (currently amended), (cancelled), (withdrawn), (new), (previously presented), or (not entered).

1. (Currently Amended) A control apparatus of an optical signal exchanger which includes a first mirror array and a second mirror array, each having a plurality of tilt mirrors arranged on a plane, each tilt mirror having a reflecting surface at an angle which is controllable, an input optical signal being sequentially reflected by said first and second mirror arrays to output at a specific position, at which power of an optical signal output at said specific position is detected, and feedback to control an angle of at least one of the reflecting surfaces of the tilt mirrors of said first and second mirror arrays, which have reflected the input optical signal, said control apparatus comprising:

a resonance component removing section that removes a frequency component corresponding to a mechanical resonance action of changing the angle of any tilt mirror of the first and second mirror array, the frequency component being included in a control signal used for said feedback control, and said resonance component removing section is shared at least by a pair of driving electrodes arranged in an axial direction of any tilt mirror<u>, selectively removing the frequency component corresponding to the mechanical resonance action for at least one of the pair of driving electrodes</u>.

2. (Previously Presented) A control apparatus of an optical signal exchanger according to claim 1, comprising:

a first mirror drive section that supplies a voltage to either one of a pair of driving electrodes arranged in a first axial direction of a tilt mirror of said first mirror array, and also supplies a voltage to either one of a pair of driving electrodes arranged in a second axial direction different from said first axial direction, to adjust the angle of the reflecting surface of said tilt mirror of said first mirror array;

a second mirror drive section that supplies a voltage to either one of a pair of driving electrodes arranged in a first axial direction of a tilt mirror of said second mirror array, and also supplies a voltage to either one of a pair of driving electrodes arranged in a second axial

direction different from said first axial direction, to adjust the angle of the reflecting surface of said tilt mirror of said second mirror array;

an optical power detection section that detects power of the optical signal output from said specific position; and

a comparison control section that generates a control signal for controlling a driving state of a controlled tilt mirror from the first mirror array or the second mirror array, so that an angular displacement of the reflecting surface of said controlled tilt mirror is corrected according to the optical power detected by said optical power detection section,

wherein said resonance component removing section includes:

a first resonance component removing section that removes said resonance frequency component included in the control signal sent from said comparison control section to said first mirror drive section, by using a band-elimination filter that is shared at least for the first axial direction and the second axial direction of a controlled tilt mirror from the first mirror array; and

a second resonance component removing section that removes said resonance frequency component included in the control signal sent from said comparison control section to said second mirror drive section, by using a band-elimination filter that is shared at least for each of the first axial direction and the second axial direction of a controlled tilt mirror from the second mirror array.

3. (Previously Presented) A control apparatus of an optical signal exchanger according to claim 2, wherein

said optical power detection section outputs an analog signal indicating the detected power of the optical signal output, to said comparison control section,

said comparison control section converts the analog signal from said optical power detection section into a digital signal, and then, according to said digital signal, outputs the control signal for controlling the driving state of the controlled tilt mirror as a digital signal, to said first and second resonance component removing sections, so that an angular displacement of the reflecting surface of said controlled tilt mirror is corrected, and

said band-elimination filter of each of said first and second resonance component removing sections which removes said resonance frequency component included in the control signal from said comparison control section, is a digital filter.

4. (Currently Amended) A control apparatus of an optical signal exchanger

according to claim 3, wherein

said comparison control section outputs an n-digit even digital value as the control signal corresponding to one driving electrode of a pair of driving electrodes arranged in an axial direction of said controlled tilt mirror, and outputs an n-digit odd digital value as the control signal corresponding to the other driving electrode of the pair of driving electrodes, and

each of said first and second resonance component removing sections determines to which one driving electrode of the pair of driving electrodes arranged in the axial direction corresponds said digital value according to the least significant bit of the n-digit even or odd digital value received from the comparison control section.

5. (Previously Presented) A control apparatus of an optical signal exchanger according to claim 3, wherein

said comparison control section outputs an n-bit digital value between 0 to 2^{n-1} as the control signal corresponding to one driving electrode of a pair of driving electrodes arranged in an axial direction of said controlled tilt mirror, and outputs an n-bit digital value between 2^{n-1} to 2^n as the control signal corresponding to the other driving electrode of the pair of driving electrodes, and

each of said first and second resonance component removing sections determines to which one driving electrode of the pair of driving electrodes arranged in the axial direction corresponds said digital value according to the most significant bit of the n-bit digital value received from the comparison control section.

6. (Previously Presented) A control apparatus of an optical signal exchanger according to claim 3, wherein

said comparison control section outputs an n-bit digital value between 0 to 2^{n-1} as the control signal corresponding to one driving electrode of the pair of driving electrodes arranged in an axial direction of said controlled tilt mirror, and outputs an n-bit digital value between 2^{n-1} to 2^n as the control signal corresponding to the other driving electrode of the pair of driving electrodes,

each of said first and second resonance component removing sections determines a difference between the n-bit digital value received from the comparison control section and a central value 2^{n-1}, and outputs a digital value corresponding to said difference, as a driving control signal, to each of said first and second mirror drive sections, and

each of said first and second mirror drive sections D/A converts the driving control signal from each of said first and second resonance component removing sections to divide the driving

control signal into positive and negative analog values, and sets said positive analog value as a control value corresponding to one of said pair of driving electrodes arranged in the axial direction, and said negative analog value as a control value corresponding to the other driving electrode.

7. (Previously Presented) A control apparatus of an optical signal exchanger according to claim 2, wherein

said optical power detection section outputs an analog signal indicating the detected power of the optical signal output, to said comparison control section,

said comparison control section converts the analog signal from said optical power detection section into a digital signal, and then, according to said digital signal, outputs the control signal for controlling the driving state of the controlled tilt mirror as a digital signal, to said first and second resonance component removing sections, so that an angular displacement of the reflecting surface of said controlled tilt mirror is corrected, and

said band-elimination filter of each of said first and second resonance component removing sections which removes said resonance frequency component included in the control signal from said comparison control section is an analogue filter,

said comparison control section outputs an n-bit digital value between 0 to 2^{n-1} as the control signal corresponding to one driving electrode of a pair driving electrodes arranged in an axial direction of said controlled tilt mirror, and outputs an n-bit digital value between 2^{n-1} to 2^n as the control signal corresponding to the other driving electrode of the pair of driving electrodes,

each of said first and second resonance component removing sections determines a difference between the n-bit digital value received from the comparison control section and a central value 2^{n-1}, and outputs said difference, as the driving control signal, to each of said first and second mirror drive sections, and

each of said first and second mirror drive sections D/A converts the driving control signal from each of said first and second resonance component removing sections to divide the control signal into positive and negative analog values, and sets said positive analog value as a control value corresponding to one of said driving electrodes arranged in the axial direction, and said negative analog value as a control value corresponding to the other driving electrode.

8. (Previously Presented) A control apparatus of an optical signal exchanger according to claim 2,

wherein said band-elimination filter of said first resonance component removing section

which removes said resonance frequency component included in the control signal received from said comparison control section to control said first mirror drive section, is shared by all tilt mirrors on said first mirror array, and

said band-elimination filter of said second resonance component removing section which removes said resonance frequency component included in the control signal received from said comparison control section to control said second mirror drive section, is shared by all tilt mirrors on said second mirror array.

9. (Previously Presented) A control apparatus of an optical signal exchanger according to claim 1,

wherein said resonance component removing section is shared by respective pairs of driving electrodes arranged in a first respective axial direction of all tilt mirrors on said first and second mirror arrays, and by respective pairs of driving electrodes arranged in a second respective axial direction different from said first axial direction.

10. (Previously Presented) A control apparatus of an optical signal exchanger according to claim 1,

wherein said resonance component removing section eliminates any component included in the control signal within a bandwidth corresponding to a variation in the frequency of the mechanical resonance.

11. (Previously Presented) A control apparatus of an optical signal exchanger according to claim 10,

wherein said resonance component removing section comprises a circuit in which a plurality of band-elimination filters having a same characteristic are serially connected.

12. (Previously Presented) A control apparatus of an optical signal exchanger according to claim 1,

wherein said resonance component removing section removes the frequency component corresponding to the mechanical resonance action included in said control signal, using a band-elimination filter of Butterworth type.

13. (Previously Presented) A control apparatus of an optical signal exchanger according to claim 1,

wherein said resonance component removing section removes the frequency component corresponding to the mechanical resonance action included in said control signal, using a band-elimination filter of Chebyshev type.

14. (Previously Presented) A control apparatus of an optical signal exchanger according to claim 1,

wherein said resonance component removing section removes the frequency component corresponding to the mechanical resonance included in said control signal, using a band-elimination filter of elliptic function type.

15. (Previously Presented) A control apparatus of an optical signal exchanger according to claim 1,

wherein said resonance component removing section removes the frequency component corresponding to the mechanical resonance included in said control signal, using a low-pass filter having a cutoff frequency corresponding to the frequency corresponding to the mechanical resonance of said tilt mirror.

16. (Currently Amended) A control apparatus of an optical signal exchanger according to claim 2,

wherein said comparison control section supplies a non-drive control signal for setting one driving electrode of the pair of driving electrodes in a non-driven state, to a corresponding mirror drive section via said corresponding resonance component removing section, when the controlled tilt mirror has the angle adjusted via the other driving electrode, after having the angle adjusted via the one driving electrode <u>of</u> the pair of driving electrodes arranged in the axial direction of said tilt mirror and then supplies a drive control signal for setting the other driving electrode <u>in</u> a driven state to the corresponding mirror drive section via said corresponding resonance component removing section.

17. (Currently Amended) A control apparatus of an optical signal exchanger according to claim 1,

wherein said resonance component removing section includes a plurality of band-elimination filters having different transfer functions from each other, and selects at least one of said plurality of band-elimination filters according to a drive voltage ~~to be~~ applied to a driving electrode of a tilt mirror, to thereby remove the frequency component of the mechanical

resonance included in said control signal.

18. (Previously Presented) A control apparatus of an optical signal exchanger according to claim 1,

wherein said resonance component removing section includes a plurality of band-elimination filters having different transfer functions, and selects one of said plurality of band-elimination filters, according to a time of initial startup and a time of feedback control.

19. (Currently Amended) A control apparatus of an optical signal exchanger according to claim 1,

wherein resonance component removing section includes a band-elimination filter whose transfer function ~~can be~~ is changed, for ~~each of said~~ different shared configurations, and said resonance component removing section changes the transfer function of said band-elimination filter according to a drive voltage to be applied to a driving electrode of any tilt mirror, to thereby remove the frequency component of the mechanical resonance included in said control signal.

20. (Previously Presented) A control apparatus of an optical signal exchanger according to claim 19,

wherein the band-elimination filter of said resonance component removing section has a transfer function that can be changed, and said resonance component removing section changes the transfer function of said band-elimination filter, according to a time of initial startup and a time of feedback control.

21. (Currently Amended) A control method of an optical signal exchanger which includes a first mirror array and a second mirror array, each having a plurality of tilt mirrors arranged on a plane, each tilt mirror having a reflecting surface at an angle which is controllable, an input optical signal being sequentially reflected by said first and second mirror arrays to output at a specific position, at which power of an optical signal output at said specific position is detected, and feedback to control the angle of at least one of the reflecting surfaces of the tilt mirrors of said first and second mirror array, which have reflected the input optical signal on said first and second mirror arrays, comprising:

removing a frequency component corresponding to a mechanical resonance action included in a control signal used for said feedback control, which is ~~commonly~~ removed for at least one of a pair of driving electrodes arranged in a coaxial direction of said tilt mirror using a

same frequency removing device.

22. (Currently Amended) A control apparatus of an optical signal exchanger which includes a first mirror array and a second mirror array, each having a plurality of tilt mirrors arranged on a plane, each tilt mirror having a reflecting surface at an angle, and the first and second mirror arrays sequentially reflecting an input optical signal to output at a specific position, where power of an output optical signal, and the angle of at least one of the reflecting surfaces of the tilt mirrors that reflected the input signal, being feedback controlled based on a detection result, by providing a feedback control signal to one of a pair of driving electrodes that change the angle of the at least one of the reflecting surfaces of the tilt mirrors, the control apparatus comprising:

a resonance component removing section that selectively removes a frequency component corresponding to a mechanical resonance from the feedback control signal, provided to ~~any~~ the one of the pair of driving electrodes, the resonance component removing section being shared by driving electrodes of the pair of driving electrodes which are arranged in a coaxial direction of said tilt mirror.